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| 10/724,882 | 12/02/2003 | Yoshihiro Uetani | Q78640 | 1657 |

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| EXAMINER | |
|---|---|
| DESAI, ANISH P | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/724,882 | UETANI ET AL. | |
| | Examiner | Art Unit | |
| | ANISH DESAI | 1794 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *23 October 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-7 and 9-13* is/are pending in the application.

4a) Of the above claim(s) *10-12* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7,9, and 13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/12/08*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

***DETAILED ACTION***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed on 10/23/08 after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/28/08 has been entered.

2. Support for newly amended claim 13 is found in the specification as originally filled.

3. All of the previously made art rejections are maintained.

4. A new 35 USC Section 112-second paragraph rejection is made.

5. A new ground of rejection is made based on a newly discovered reference of Kinzer et al. (US 5,667,893).

6. All of the previously made obviousness type double patenting rejections are maintained.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-7, 9, and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. Regarding claim 1 recitation "crosslinking polymer" and "a polymer layer comprising a crosslinking polymer having...presence of cation." is ambiguous. It is unclear as to what is meant by "crosslinking polymer". Does Applicant intend to claim a polymer that is **capable** of being crosslinked (i.e. polymer is not crosslinked as recited in claims)? It appears that by reciting "crosslinking polymer having plural cation-polymerizable functional groups and being **polymerizable** in the presence of cation", Applicant is intending to claim that the crosslinking polymer not polymerized (crosslinked); but the "crosslinking polymer" is capable of being polymerized due to the presence of plural cation-polymerizable functional group. However, the recitation **polymer** comprising crosslinking polymer is ambiguous because the presence of phrase "polymer" before "crosslinking polymer" is ambiguous, because it is not clear whether the crosslinking polymer is already crosslinked (polymerized) or functionally capable of being polymerized in the presence of cation.

9. The Examiner respectfully suggests replacing "a polymer layer formed on the porous film substrate so as to be in the contact...porous film substrate" with "a crosslinking polymer layer formed on the porous substrate so as to be in contact...porous film substrate". Further, the Examiner suggests the deletion of "polymer layer" at second instance.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as anticipated by Kinzer et al. (US 5,667,893).

11. Kinzer discloses following in abstract:

> The present invention relates to an article comprising a substrate which has coated thereon a photopolymerizable epoxy composition containing a plurality of epoxides including at least one selected from the group consisting of bisphenol A epoxides and cycloaliphatic epoxides, and at least one aliphatic epoxide, from about 0.1% to about 2% of at least one organometallic cationic initiator capable of initiating polymerization at wavelengths of from about 200 to about 600 nm, and optionally at least one accelerating agent. The article can be a flexible tape backing or a chip-resistant paint.

12. Additionally, at column 6 lines 25-30 Kinzer discloses following:

> Useful tape backing substrates for the invention include porous substrates such as glass cloth; papers such as flat back paper, and crepe paper; nonwovens, such as polyester, and cellulose triacetate. Also useful, though less preferred are nonporous substrates, including film-forming polymers, e.g., polyesters, acetates, polyphenylene sulfide, polyimide, and the like.

13. Further in the "Background of the Invention", Kinzer discloses following:

> The present invention relates to an article which can be a backing material for a tape comprising a flexible substrate which is either coated or impregnated with a polymerizable, cationically sensitive composition, or the article can be a substrate coated with a flexible paint comprising a polymerizable, cationically sensitive composition. Polymerization is achieved using an ionic organometallic compound as a photoinitiator.

14. Regarding claim 1, it is noted that Applicant has provided no guidance as to the composition of the crosslinking polymer other than reciting the crosslinking polymer having plural cation-polymerizable functional groups being polymerizable in the presence of cation. The aforementioned, disclosure of Kinzer is interpreted to read on Applicant's "a polymer layer formed on the porous film substrate so as to be in contact with the porous film substrate; the polymer layer comprising a crosslinking polymer having plural cation-polymerizable functional groups...cation."

15. With respect to the preamble recitation "crosslinking polymer-supported porous film for battery separator", the aforementioned not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951). Accordingly, Kinzer anticipates claimed invention.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

16. Claims 1-7, 9, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yuji et al. (JP 2002-110245-machine translation previously provided by the Examiner) in view of Nakagawa et al. (WO01/75991) substantially as set forth in the previous Office Action.

17. Regarding claims 1 and 13, Yuji et al. discloses a lithium ion secondary battery, which uses a solid polymer electrolyte (abstract, page 6) and a liquid crosslinkable composition for the solid electrolyte (0001). The liquid crosslinkable composition for the solid electrolytes of Yuji et al. comprises radically polymerizable monomers of oxetane ring containing monomer and epoxy group containing monomer (0011). Moreover Yuji et al. teaches a battery separator (0004). Additionally, Yuji et al. teaches that the liquid crosslinkable composition containing oxetane group and epoxy group is injected into the airtight container, which has units such as electrodes and separator (0020). The liquid composition infiltrates into gaps such as electrode and a separator (0020).

18. With respect to claim 1, it is noted that the reference of Yuji discloses same crosslinking polymer containing cation-polymerizable functional group selected from the group consisting of 3-oetanyl group and epoxy as claimed by Applicant. The difference between the invention of Yuji and the presently claimed invention is that Yuji does not

explicitly teach of coating of aforementioned crosslinking polymer composition onto a porous film substrate. Instead, Yuji discloses injecting aforementioned crosslinking polymer into the airtight container (i.e. battery), which has units such as electrodes and battery separator. However, Nakagawa teaches that as a method for inhibiting liquid electrolyte leakage there is known a method, which comprises incorporating a crosslinkable monomer in a liquid electrolyte, subjecting the liquid electrolyte to crosslinking reaction to produce a jelly solidified gel electrolyte, and then using the solid electrolyte comprising a solidified liquid electrolyte singly or in combination with a substrate as a separator (0004). According to Nakagawa such method has disadvantage because in the case of such a gel electrolyte, ions move through the gel at a very low rate than in the liquid electrolyte, easily causing an increase of internal resistivity of battery and drop of high rate discharge capacity. The resulting battery shows insufficient battery properties (0005). To overcome these disadvantages Nakagawa teaches a separator for battery prepared by impregnating or coating a porous material (porous film/membrane) with a monomer solution comprising crosslinkable monomer (0071). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the porous film of Nakagawa as a battery separator in the invention of Yuji and form a polymer layer on the porous film as taught by Nakagawa, motivated by the desire to avoid increase of internal resistivity of a battery and drop of high rate discharge capacity.

19. Regarding claim 2, the oxetane ring containing monomer of Yuji et al. contains 3-oxetanyl group (0013).

20. With respect to claim 3, the liquid crosslinkable composition contains the other radically polymerizable monomer (claim 2). Further, Yuji et al. teach the claimed formula III on pages 27 and 28, which reads on the methacrylate monomer as represented by formula III as claimed.

21. Regarding claim 4, Yuji et al. teach that the quantity of the radically polymeizable monomer with oxetane ring and another radically polymerizable monomer is 5 to 50% by weight (claims 2 and 3).

22. With respect to claim 5, Yuji et al. disclose that the quantity of the radically polymerizable monomer having epoxy group and the other radically polymerizable monomer is 5 to 50% by weight (claims 4 and 5).

23. Regarding claims 6 and 7, Yuji et al. teach the claimed 3-oxetanyl group containing (meth) acrylate formula (I) on page 25 and claimed epoxy group containing (meth) acrylate formula (II) on pages 26 and 27 respectively.

24. Regarding claim 9, Yuji is silent as to teaching of porous film substrate having a thickness of 3 to 50 μm and a porosity of 30 to 95%. The invention of Nakagawa is previously disclosed. Nakagawa teaches that the thickness of the porous material (porous film/membrane) is not greater than 30 μm (0069) and the porous material has porosity of 50% (0106). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the porous film substrate of Nakagawa with the thickness and porosity as taught by Nakagawa as a battery separator in the invention of Yuji, motivated by the desire to provide a suitable battery separator.

***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

25. Claims 1-7 and 9-13 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-17 and claims 1-17 of copending Application No. 11/267,404 and 10/569,417 respectively. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1-7 and 9-13 of presently claimed invention encompass the same subject matter as claimed by claims 1-17 of aforementioned copending applications.

26. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

***Response to Arguments***

27. Applicant's arguments with respect to claims 1-7, 9, and 13 received on 10/23/08 are fully considered, but they are not found persuasive.

28. Regarding the art rejection based on Yuji (JP'245) in view of Nakagawa,

29. In response to the Examiner's comments in the Advisory Action mailed on 08/06/08 Applicant argues following on page 7 of 10/23/08 amendment:

> JP '245 discloses that a molecular weight of (the oxetane ring) polymer is set to 10,000 or more. *See* [0011]. Additionally, JP '245 discloses that when the molecular weight of the polymer is less than 10,000, there is a trend that the necessary amount of the polymer that is required for forming the gel is larger. As is clear from this disclosure of JP '245, the crosslinking polymer of JP '245 has a molecular weight of more than 10,000 in a state that the polymer has not yet been crosslinked.
>
> In contrast, although Nakagawa discloses the final formation of a "polymer skeleton," it is formed by crosslinking the "monomer" solution. Therefore, it is clear that in Nakagawa, the crosslinking ***monomer***, has a preferable molecular weight of 2000 or less in a state that the monomer has not yet been crosslinked.

30. Further, on page 8 of 10/23/08 amendment Applicant argues following:

Although there is a difference of expression between "polymer" (JP '245) and "monomer (Nakagawa), both references disclose the molecular weight of polymer/monomer which is not crosslinked, respectively.

Thus, based on the foregoing, it is respectfully submitted that it would be difficult to combine a porous substrate disclosed in Nakagawa with the polymer disclosed in JP '245.

Accordingly, one of ordinary skill in the art would not be led to arrive at the claimed invention based on the disclosure of JP '245 and Nakagawa.

31. The Examiner respectfully submits that he is not sure as to what arguments Applicant is intending to make. Specifically, it is not clear as to how is the molecular weight of monomer/polymer is related to the basis of the rejection. Nothing in the claim is specific about the molecular weight of polymer. The Examiner respectfully submits that the secondary reference of Nakagawa is relied on to teach a porous film substrate which has nothing to do with the molecular weight of polymer/monomer. Accordingly, Applicant's arguments are not found persuasive.

***Conclusion***

32. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANISH DESAI whose telephone number is (571)272-6467. The examiner can normally be reached on Monday-Friday, 8:00AM-4:30PM.

33. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on 571-272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

34. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. D./
Examiner, Art Unit 1794

/Hai Vo/
Primary Examiner, Art Unit 1794